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**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/688,989 10/17/00 TSUNASHIMA

Y 04329.1952-0

MM91/1010  
FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.  
1300 I STREET, NW  
WASHINGTON DC 20005

EXAMINER

RAO, S

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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**Office Action Summary**

Application No.

09/688,989

Applicant(s)

TSUNASHIMA ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 27,28 and 30-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27,28 and 30-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Response to Amendment***

Applicants' amendment filed July 12, 2001 has been entered on July 23, 2001.

Therefore claims 27-28 as recited in the amendment of February 26, 2001 and claims 30-32 as recited in the amendment of July 12, 2001 are currently pending in the application.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 27-28 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kume et al. ( U. S. Patent No. 5,188,976 herein after Kume) also previously applied.

With respect to claim 27, in addition to the teachings previously stated Applicants' state that Kume does not teach , " said first and second insulator films are different in at least one of thickness, material and material composition, and said first and second gate electrodes are different in at least one of material and material composition."

Claim 27 as stated above specifically describes its first and second insulator films as such and does not describe/limit them to gate insulator films. Kume describes its insulating film in the memory transistor as a composite comprising three layers 18,19, and 20 wherein 18 and 20 are silicon oxide layers and layer 19 is silicon nitride layer, ( Kume col. 10 lines 7-15). therefore this insulating layer is formed of a composite of oxide/nitride/oxide film.

Further this layer is about 28nm thick ( layer 18 is 4nm thick, layer 19 is 20nm thick and layer 20 is 4nm thick for a total thickness of 28nm). ( Kume col. 10 lines 14-17).

Kume describes a gate oxide film 27 of 18nm thick ( col. 10 lines 51-54) for the Mos device.

Therefore Kume describes its first and second insulator films to be different in thickness ( 28nm and 18 nm) and material and material composition ( oxide/nitride/oxide composite and only oxide layer).

Applicants' state that Kume fails to disclose the gate electrodes as being of different in material or composition.

Kume in fig. 10 and 11 describes a gate for the peripheral circuit MOS transistor area as comprising a gate made up of three layers polysilicon/polysilicon /tungsten polycide and the transistor in the memory transistor area is formed of polysilicon layer/polysilicon layer and without the tungsten polycide layer.

Therefore Kume describes the gate electrodes (in the memory and peripheral areas ) as being different in material and composition. ( one gate is two layered of polysilicon and the second gate is three layered with two polysilicon layers and a tungsten polycide layer).

Therefore Kume teaches each and every limitation of claim 27.

Claim 28 was alleged to be allowable as it depends on claim 27, however as shown above claim 27 is not allowable therefore claim 28 is also not allowable.

Claims 30 to 32 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kume.

With respect to claim 30 the previous rejection is maintained and the following explanation is in response to applicants' arguments.

As per applicants' request on page 6 lines 5-7 asking the examiner to provide a reference showing the use of a damascene process in forming gate electrodes of different material or material composition, The Examiner refers the applicants to the series of Cronin et al Patents e.g. 5,496, 771 ( copy enclosed) and 5,677,563 etc.

Cronin '771 patent in col. 2 lines 25-28 describes its invention as comprising Damascening which is defined as the generally known in the art as damascene techniques and sometimes referred to herein as " damascening". Further Cronin '771 in col, 2 lines 43-45 describes the invention as forming two gate stacks of equal height but different composition above an upper surface of a substrate. (emphasis supplied).

Applicants' further state the Examiner has not provided the rationale as to why damascene would be used as one of the well-known methods and also the motivation to combine damascene process with Kume.

The examiner's response why damascene would be used as one of the well-known methods to provide a fabrication technique without overly complex fabrication steps that offer a circuit designer flexibility and provide options based on available processing technologies without scarifying the electrical response of current circuit designs. ( Cronin col.2 lines 10-19) . The motivation to combine damascene process

with Kume is to obtain a structure that is precisely formed with predictable shapes and electrical characteristics. ( Cronin col. 2 line 15-17).

The Applicants' and their Attorney's seems to have not understood the previous rejection of claim 32 and for the sake of convenience reproduced here. " With respect to claim 32, in addition to the elements of claim 28, it recites that the gate electrodes and the connection layer are coplanar, Kume in fig. 18 shows the electrodes being coplanar and the connection layer being non-planar. However it is an obvious design choice to make the connection layer also coplanar if additional layers or devices are to be made on top of the electrodes and the connection layer, especially in the Applicants' claimed Damascene process wherein 6-7 layered structures are common."

The examiner has stated in the above rejection that to make the connection layer also coplanar if additional layers or devices are to be made on top of the electrodes and the connection layer, especially in the Applicants' claimed Damascene process wherein 6-7 layered structures are common."

The current case law as said in *In re Dailey*, 149 USPQ 47 ( CCPA 1976) :

*" As noted above, Matzen discloses that the flexible portion of his container is drawn into the rigid top portion, filling the space thereof. Appellants have presented no argument which convinces us that the particular configurations of their container is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing mating surfaces in the collapsed container of Matzen. See **Graham V. John D re Co. 383 U.S.1, 148 USPQ 459.***

Therefore the rejection is based on an obvious design choice and not an well known in the art rejection therefore the examiner is not required to show the "missing limitation" or the motivation to combine with the teaching of Kume.

In fact in view of the above Applicants' response to the rejection of claim 32 is not responsive.

Therefore all pending claims 27-28 and 30-32 are rejected for reasons previously set out and those stated above.

### ***Response to Arguments***

Applicant's arguments filed July 12, 2001 have been fully considered but they are not persuasive. Because for reasons set out in detail above.

Applicant's arguments and amendment necessitated the new ground(s) of rejection presented in this Office action.

It is noted that the same references as used in the previous rejection have been used thus providing an additional separate basis for this making this action Final.

( the cited Cronin reference is provided as per applicants' request to demonstrate what is well known in the art) .

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the



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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Steven H. Rao at telephone number 703-306-5945.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703- 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703- 308-0956.

*He*  
*10/24/01*



Olik Chaudhuri  
Supervisory Patent Examiner  
Technology Center 2800

*(Olik Chaudhuri)*  
Supervisory Patent Examiner  
Technology Center 2800